ICD

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/849,781	05/04/2001	Michael Snyder	6523-028	9891

20583 7590 05/06/2004

JONES DAY
222 EAST 41ST ST
NEW YORK, NY 10017

EXAMINER	
TRAN, MY CHAU T	
ART UNIT	**PAPER NUMBER**
1639	

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/849,781	SNYDER ET AL.	
	Examiner	Art Unit	
	MY-CHAU T TRAN	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16,93-101,106-136 and 138-180* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,134-136,141,161,164,166,169,170,173,174,177,178 and 180* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 April 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 12-16,93-101,106-110,112-133,138-140,142 160,162,163,165, 167-168,171-172,175-176, and 179.

DETAILED ACTION

Status of Claims

1. Applicant's amendment filed 1/21/04 is acknowledged and entered. Claims 1-10, 93, 108-109, and 134-135 have been amended. Claims 162-180 have been added.

2. Applicant's amendment filed 8/20/03 is acknowledged and entered. Claims 111, and 137 have been canceled. Claims 160-161 have been added.

3. Claims 17-92, and 102-105 are canceled by the amendment filed on 4/10/03.

4. Claims 1-16, 93-101, 106-111, 112-136, and 138-180 are pending.

5. This application claims priority to two provisional applications. They are 60/201, 921 filed 5/4/2000, and 60/221,034 filed 7/27/2000.

6. Applicant has elected the following species for the elected invention (Claims 1-16, 93-101, 106-111, 112-136, and 138-180):

a. A single specific species of the plurality of proteins or molecules: plurality of proteins.

b. A single specific species of organism: a mammal.

c. A single specific species of biological activity: kinase activity.

d. A single specific species of solid support: a glass slide.

e. A single specific species of interaction between the surface of the support and the substance: covalently bound.

f. A single specific species of assaying reagent. This species is withdrawn in view of applicant argument filed 1/21/04.

g. A single specific species of volumes of the wells: the range between 1nl and 1 μl. However, this election is moot with regard to the election of the solid support as being glass slide.

h. A single specific species of the bottoms shape of the wells: round-shaped. However, this election is moot with regard to the election of the solid support as being glass slide.

7. Claims 12-16, 93-101, 106-110, 112-133, 138-140, 142-160, 162-163, 165, 167-168, 171-172, 175-176, and 179 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to ***nonelected species***, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper filed 8/20/2003.

Drawings

8. The drawings were received on 4/10/03. These drawings are acceptable.

9. Claims 1-11, 134-136, 141, 161, 164, 166, 169-170, 173-174, 177-178, and 180 are treated on the merit in this Office Action.

Withdrawn Rejections

10. In view of applicant's amendments of claims 1 and 93, the rejection of claims 1-11 and 106-107 under 35 USC 102(e) as anticipated by Wagner et al. (US Patent 6,329,209) has been withdrawn.

11. In view of applicant's amendments of claims 1 and 93, the rejection of claims 93-101 under 35 USC 103(a) as being obvious over Wagner et al. (US Patent 6,329,209) in view of Foster et al. (US patent 4,44,879) has been withdrawn.

12. In view of applicant's amendments of claims 1 and 93, the rejection of claims 1-13 and 15-16 under 35 USC 103(a) as being obvious over Taylor (US Patent 6,103,479) has been withdrawn.

13. In view of applicant's amendments of claims 1 and 93, the rejection of claim 14 under 35 USC 103(a) as being obvious over Taylor (US Patent 6,103,479) in view of Wang et al. (US Patent 5,922,617) has been withdrawn.

New Rejections – Necessitated by Amendment

Claim Rejections - 35 USC § 112

14. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

15. Claims 1-11, 134-136, 141, 161, 164, 166, 169-170, 173-174, 177-178, and 180 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. (This is a written description rejection)

The instant claim 1 briefly recites an addressable array comprising a plurality of substances on a solid support wherein each different substance being at a position on the solid support. The substances comprises a plurality of proteins consisting of at least 50% of all expressed proteins with the same type of biological activity in the genome of an organism. The different substances on the array have a density of at least 100 different substances per cm^2.

The specification disclosure does not sufficiently teach an addressable protein array wherein the protein is from ***any*** organism. The specification disclosures are drawn to an array of yeast protein especially protein kinase as disclosed by the specification examples (Example I on pg. 27, line 19 to pg. 35, line 20 Example II on pg. 41, line 19 to pg. 43, line 6). Thus specification does not provide an adequate representation regarding the full scope of the presently claimed addressable protein array wherein the protein is from ***any*** organism.

The specification disclosure does not sufficiently teach an addressable array of protein with ***any*** type of biological activity. The specification disclosure and examples are directed to a protein array with kinase activity (pg. 15, lines 3-7; Example I on pg. 27, line 19 to pg. 35, line 20; Example II on pg. 41, line 19 to pg. 43, line 6). Thus, the specification does not provide an adequate representation regarding the full scope of the presently claimed addressable array of protein with ***any*** type of biological activity.

The specification disclosure does not sufficiently teach an addressable protein array wherein the proteins represent 50% of all expressed proteins with the same type of biological activity in the genome of an organism. The specification discloses that "*the yeast genome has been sequenced and contains approximately 6200 open reading frames greater than 100 codons in length; 122 of these are predicted to encode protein kinases*" (i.e. there is a ***possible*** 122 protein kinases found in a yeast genome) (pg. 27, lines 32-34). However, this is not the ***definitive*** total number of protein kinases in a yeast genome since it is a ***predicted*** number. In fact, Hunter et al. (*TIBS*, **1992**, 22(1):18-22) disclose that there is no consensus in the total number of protein kinase of a yeast genome wherein they found a total of ~120 protein kinases, which is less than the estimate number of yeast protein kinases that was based on the sequencing of chromosome III (pg. 21, 2nd col., line 62 to 3rd col., line 5). Since there is no definitive total number of protein kinase for a yeast genome, the specification is silent on an addressable protein array wherein the proteins are 50% of ***all*** expressed proteins with the same type of biological activity in the genome of an organism.

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention.* The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed.*" (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116.).

With the exception of a yeast protein kinase array disclosed by the specification, the skilled artisan cannot envision an addressable protein array wherein the protein is from ***any***

organism, an addressable array of protein with ***any*** type of biological activity, and/or an addressable protein array wherein the protein is 50% of all expressed proteins. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for making and using it. See Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993) and Amgen Inc. V. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016. In Fiddes v. Baird, 30 USPQ2d 1481, 1483, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class. The specification provided only the bovine sequence.

Finally, University of California v. Eli Lilly and Co., 43 USPQ2d 1398, 1404, 1405 held that:

> ...To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention." *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (1997); In *re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (" [T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." *Lockwood*, 107 F.3d at 1572, 41 USPQ2d at 1966.

In the present instance, the specification supports an addressable yeast protein kinase array. The specification does not teach an addressable protein array wherein the protein is from ***any*** organism, an addressable array of protein with ***any*** type of biological activity, and/or an addressable protein array wherein the protein is 50% of all expressed proteins with the same type of biological activity in the genome of an organism. Therefore, only an addressable yeast protein

kinase array, but not the full breadth of the claim addressable protein array meet the written description provision of 35 U.S.C 112, first paragraph.

16. Claims 1-11, 134-136, 141, 161, 164, 166, 169-170, 173-174, 177-178, and 180 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There are many factors to consider when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any experimentation is "undue". These factors include, but are not limited to: 1) The breadth of the claims; 2) The nature of the invention; 3) The state of the prior art; 4) The level of one of ordinary skill; 5) The level of predictability in the art; 6) The amount of direction provided by the inventor; 7) The presence or absence of working examples; and 8) The quantity of experimentation necessary needed to make or use the invention based on the disclosure. (See *In re Wands* USPQ 2d 1400 (CAFC 1988)).

(1-2) The breadth of the claims and the nature of the invention:

The instant claim 1 briefly recites an addressable array comprises a plurality of substances on a solid support wherein each different substance being at position on the solid support. The substances comprises a plurality of proteins consisting of at least 50% of all

expressed proteins with the same type of biological activity in the genome of an organism. The different substances on the array have a density of at least 100 different substances per cm^2.

The proteins of the claim array are derived from "50% of all expressed proteins" of a genome of "any organism" (see pg. 11, lines 19-25; claims 136, 164, and 166) with the same type of biological activity (i.e. any type of functionality). Additionally, the claim further does recites the means for determining the percentage of a single specific species protein from a single specific species of organism wherein the total number of a single specific species protein from a single specific species of organism is indefinite (i.e. within the genome of a single specific species of organism the ***total number*** of a single specific species protein is unknown). Thus the claimed protein array encompasses a broad genus of proteins, which has yet to be identified by the specification and the state of the art.

(3 and 5) The state of the prior art and the level of predictability in the art:

The present invention relates to a broad generic of a "protein array" wherein the protein is derive from "50% of all expressed proteins" of a genome of "any organism". The ability to determine within the genome of a single specific species of organism the ***total number*** of a single specific species protein is unpredictable because the ***total number*** is unknown. For example, within the family of protein kinases there are distinct differences between the types of protein kinases found in multicellular organism (eukaryotic) and single cell organism (prokaryotic) because the protein kinases unique to multicellular organism would have function in cellular communication such as between cells, tissue, and the environment would not be presence in single cell organism (see Hunter et al. (*TIBS*, **1992**, 22(1):18-22): pg. 18, 1st col.,

lines 21-35). Furthermore, there is no consensus in the total number of protein kinase of a yeast genome wherein they found a total of ~120 protein kinases, which is less than the estimate number of yeast protein kinases that was based on the sequencing of chromosome III (Hunter: pg. 21, 2nd col., line 62 to 3rd col., line 5). Therefore, it is unpredictable to determine within the genome of a single specific species of organism the ***total number*** of a single specific species protein and that the protein is "50% of all expressed proteins" of a genome of "any organism".

(4) The level of one of ordinary skill in the art:

The level of skill would be high, most likely at the Ph.D. level.

(6-7) The amount of direction provided by the inventor and the existence of working examples.

The specification disclosures are drawn to an array of yeast protein especially protein kinase as disclosed by the specification examples on a solid support (Example I on pg. 27, line 19 to pg. 35, line 20 Example II on pg. 41, line 19 to pg. 43, line 6). The specification does not have sufficient guidance for a protein array comprises proteins that are 50% of all expressed proteins with the same type of biological activity in the genome of any organism. The specification does not adequately disclose a representative number of examples of protein for the entire genus of organism (e.g. within each of the species of prokaryotic and eukaryotic there are subspecies such as rat and horse that are distinct from each other). The specification does not adequately disclose a representative number of examples of protein with any type of biological activity (e.g. the family of protein kinase there are subfamilies that are structurally and functionally distinct from one another such as the histidine protein kinases and tyrosine kinases).

The specification is silent on how to determine wherein the proteins are 50% of ***all*** expressed proteins with the same type of biological activity in the genome of any organism.

(8) The quantity of experimentation needed to make or use the invention based on the content of the disclosure:

Accordingly, the claims are broad in scope with regard to the type of proteins on the protein array and the lack of specification guidance as how to determine wherein the proteins are 50% of ***all*** expressed proteins with the same type of biological activity in the genome of any organism would necessarily result in undue experimentation for one of ordinary skill wishing to practice the presently claimed invention.

17. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

18. Claims 1-11, 134-136, 141, 161, 164, 166, 169-170, 173-174, 177-178, and 180 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) The phrase "50% of all expressed protein with the same type of biological activity in the genome of an organism" in claim 1 is indefinite because it is unclear as to the means of determining the percentage of a single specific species protein from a single specific species of organism wherein the total number of a single specific species protein from a single specific species of organism is indefinite (i.e. within the genome

of a single specific species of organism the ***total number*** of a single specific species protein is unknown).

b) The phrase "75% of all expressed protein with the same type of biological activity in the genome of an organism" in claim 134 is indefinite because it is unclear as to the means of determining the percentage of a single specific species protein from a single specific species of organism wherein the total number of a single specific species protein from a single specific species of organism is indefinite (i.e. within the genome of a single specific species of organism the ***total number*** of a single specific species protein is unknown).

c) The phrase "90% of all expressed protein with the same type of biological activity in the genome of an organism" in claim 134 is indefinite because it is unclear as to the means of determining the percentage of a single specific species protein from a single specific species of organism wherein the total number of a single specific species protein from a single specific species of organism is indefinite (i.e. within the genome of a single specific species of organism the ***total number*** of a single specific species protein is unknown).

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 1-11, 134-136, and 161 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. (US Patent 6,329,209 B1; *filing date 7/14/1999*).

Wagner et al. disclose an array of protein-capture agents (col. 2, line 63 to col. 3, line 9). The array comprises a plurality of different protein-capture agents immobilized on a plurality of patches that are arranged in discrete, known regions on the substrate (solid support) surface (i.e. each different substance being at a different position on the solid support). The protein-capture agents include proteins (col. 4, lines 48-67), which are expressed either in vivo or in vitro (col. 24, 18-59). The substrate comprises material such as glass (col. 13, lines 59-65) and is structurally flat (col. 13, lines 48-58). The protein-capture agents are immobilized onto the surface of the substrate through a monolayer of the formula X-R-Y, wherein Y is the functional group responsible for binding the protein-capture agents onto the monolayer (col. 17, lines 19-43; col. 19, lines 8-67). The binding partner of the protein-capture agents includes kinases (biological activity) (col. 12, lines 16-40). The area of the patches comprises 1 cm^2 (col. 10, lines 47-59) and comprises different protein capture agent (col. 11, lines 28-42). Furthermore,

the number of different protein capture agent on an array would vary depending on the application desired (col. 11, lines 12-27).

The array of Wagner et al. does not expressly disclose the proteins are 50%, 75%, or 90% of all expressed proteins.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include proteins that are 50%, 75%, or 90% of all expressed proteins in the array of Wagner et al. One of ordinary skill in the art would have been motivated to include proteins that are 50%, 75%, or 90% of all expressed proteins in the array of Wagner et al. because Wagner et al. disclose that the protein-capture agents are expressed from organism such as *Escherichia coli* and *Saccharomyces cerevisiae* (col. 25, lines 12-59), and the protein-capture agents are used to bind proteins such as kinases (col. 12, lines 16-40). Thus the percentage of expressed proteins produced from an organism would be a choice of experimental design and is considered within the purview of the cited prior art. Furthermore, one of ordinary skill in the art would have reasonably expectation of success in including proteins that are 50%, 75%, or 90% of all expressed proteins in the array of Wagner et al. because the array of Wagner et al. is use for biological assays. The specificity of the assay would have been determined by the type of "target" being detected in order to design the type of probe (i.e. protein-capture agent) to use, and Wagner et al. discloses several different methods of producing and selecting protein-capture agent that would specifically bind to the "target" of interest (col. 24, line 18 to col. 32, line 32).

22. Claims 1-11, 134-136, 161, 164, 166, 173-174, 177-178, and 180 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. (US Patent 6,329,209 B1; *filing date 7/14/1999*) and Bielke et al. (*Gene*, **1994**, 139(2):235-239).

Wagner et al. disclose an array of protein-capture agents (col. 2, line 63 to col. 3, line 9). The array comprises a plurality of different protein-capture agents immobilized on a plurality of patches that are arranged in discrete, known regions on the substrate (solid support) surface (i.e. each different substance being at a different position on the solid support). The protein-capture agents include proteins (col. 4, lines 48-67), which are expressed either in vivo or in vitro (col. 24, 18-59). Additionally, Wagner et al. discloses several different methods of producing and selecting protein-capture agent that would specifically bind to the "target" of interest (col. 24, line 18 to col. 32, line 32). The substrate comprises material such as glass (col. 13, lines 59-65) and is structurally flat (col. 13, lines 48-58). The protein-capture agents are immobilized onto surface of the substrate through a monolayer of the formula X-R-Y, wherein Y is the functional group responsible for binding the protein-capture agents onto the monolayer (col. 17, lines 19-43; col. 19, lines 8-67). The binding partner of the protein-capture agents includes kinases (biological activity) (col. 12, lines 16-40). The area of the patches comprises 1 cm^2 (col. 10, lines 47-59) and comprises different protein capture agent (col. 11, lines 28-42). Furthermore, the number of different protein capture agent on an array would vary depending on the application desired (col. 11, lines 12-27) and the percentage (i.e. 50%, 75%, and 90%) of expressed protein produce from an organism would be a choice of experimental design and is considered within the purview of the cited prior art.

The array of Wagner et al. does not expressly include mammalian protein kinases for use as a probe.

Bielke et al. disclose the method of producing (i.e. expressing) a murine of serine/threonine kinase and using it as a probe to identify testis-specific gene family (Abstract; pg. 236, left col., lines 19-43).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include mammalian protein kinases for use as a probe as taught by Bielke et al. in the array of Wagner et al. One of ordinary skill in the art would have been motivated to include mammalian protein kinases for use as a probe in the array of Wagner et al. for the advantage of providing an automated and/or miniaturized platform for an assay (Wagner: col. 2, lines 52-55) since both Wagner et al. and Bielke et al. disclose the method of mammalian cell-based expression of proteins (Wagner: col. 26, lines 1-9; Bielke: pg. 236, left col., lines 19-43). Furthermore, one of ordinary skill in the art would have reasonably expectation of success in the combination of Wagner et al. and Bielke et al. because the specificity of the assay would been determine by the type of "target" being detected in order to design the type of probe (i.e. protein-capture agent) to use, and Wagner et al. discloses several different methods of producing and selecting protein-capture agent that would specifically bind to the "target" of interest (col. 24, line 18 to col. 32, line 32).

23. Claims 1-11, 134-136, and 161 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. (US Patent 6,329,209 B1; *filing date 7/14/1999*) and Stern et al. (*Molecular and Cellular Biology*, **1991**, 11(2):987-1001).

Wagner et al. disclose an array of protein-capture agents (col. 2, line 63 to col. 3, line 9). The array comprises a plurality of different protein-capture agents immobilized on a plurality of patches that are arranged in discrete, known regions on the substrate (solid support) surface (i.e. each different substance being at a different position on the solid support). The protein-capture agents include proteins (col. 4, lines 48-67), which are expressed either in vivo or in vitro (col. 24, 18-59). Additionally, Wagner et al. discloses several different methods of producing and selecting protein-capture agent that would specifically bind to the "target" of interest (col. 24, line 18 to col. 32, line 32). The substrate comprises material such as glass (col. 13, lines 59-65) and is structurally flat (col. 13, lines 48-58). The protein-capture agents are immobilized onto surface of the substrate through a monolayer of the formula X-R-Y, wherein Y is the functional group responsible for binding the protein-capture agents onto the monolayer (col. 17, lines 19-43; col. 19, lines 8-67). The binding partner of the protein-capture agents includes kinases (biological activity) (col. 12, lines 16-40). The area of the patches comprises 1 cm^2 (col. 10, lines 47-59) and comprises different protein capture agent (col. 11, lines 28-42). Furthermore, the number of different protein capture agent on an array would vary depending on the application desired (col. 11, lines 12-27) and the percentage (i.e. 50%, 75%, and 90%) of expressed protein produce from an organism would be a choice of experimental design and is considered within the purview of the cited prior art.

The array of Wagner et al. does not expressly include yeast protein kinases for use as a probe.

Stern et al. disclose the method of expressing protein kinase of *Saccharomyces cerevisiae* for use in an assay to identify tyrosine kinases (pg. 987, right col., lines 3-8; pg. 991).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include yeast protein kinases for use as a probe as taught by Stern et al. in the array of Wagner et al. One of ordinary skill in the art would have been motivated to include yeast protein kinases for use as a probe in the array of Wagner et al. for the advantage of providing an automated and/or miniaturized platform for an assay (Wagner: col. 2, lines 52-55) since both Wagner et al. and Stern et al. disclose the method of *Saccharomyces cerevisiae* expressions of proteins (Wagner: col. 25, lines 49-59; Stern: pg. 991). Furthermore, one of ordinary skill in the art would have reasonably expectation of success in the combination of Wagner et al. and Stern et al. because the specificity of the assay would been determine by the type of "target" being detected in order to design the type of probe (i.e. protein-capture agent) to use, and Wagner et al. discloses several different methods of producing and selecting protein-capture agent that would specifically bind to the "target" of interest (col. 24, line 18 to col. 32, line 32).

24. Claims 1-11, 134-136, and 161 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. (US Patent 6,329,209 B1; *filing date 7/14/1999*) and Maskos et al. (*Nucleic Acids Research*, **1992**, 20(7):1679-1684).

Wagner et al. disclose an array of protein-capture agents (col. 2, line 63 to col. 3, line 9). The array comprises a plurality of different protein-capture agents immobilized on a plurality of patches that are arranged in discrete, known regions on the substrate (solid support) surface (i.e. each different substance being at a different position on the solid support). The protein-capture agents include proteins (col. 4, lines 48-67), which are expressed either in vivo or in vitro (col.

24, 18-59). Additionally, Wagner et al. discloses several different methods of producing and selecting protein-capture agent that would specifically bind to the "target" of interest (col. 24, line 18 to col. 32, line 32). The substrate comprises material such as glass (col. 13, lines 59-65) and is structurally flat (col. 13, lines 48-58). The protein-capture agents are immobilized onto surface of the substrate through a monolayer (linker) of the formula X-R-Y, wherein Y is the functional group responsible for binding the protein-capture agents onto the monolayer (col. 17, lines 19-43; col. 19, lines 8-67). The functional group include hydroxyl group (col. 19, lines 62-67). The binding partner of the protein-capture agents includes kinases (biological activity) (col. 12, lines 16-40). The area of the patches comprises 1 cm^2 (col. 10, lines 47-59) and comprises different protein capture agent (col. 11, lines 28-42). Furthermore, the number of different protein capture agent on an array would vary depending on the application desired (col. 11, lines 12-27) and the percentage (i.e. 50%, 75%, and 90%) of expressed protein produce from an organism would be a choice of experimental design and is considered within the purview of the cited prior art.

The array of Wagner et al. does not expressly include 3-glycidoxypropyltrimethoxysilane linker.

Maskos et al. disclose the method of synthesizing oligonucleotides on a glass support using a 3-glycidoxypropyltdmethoxysilane linker (Abstract; pg. 1679, right col. 3-9; fig. 1).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a 3-glycidoxypropyltrimethoxysilane linker as taught by Maskos et al. in the array of Wagner et al. One of ordinary skill in the art would have been motivated to include a 3-glycidoxypropyltrimethoxysilane linker in the array of Wagner et al. for the

advantage of providing a linker that is easy to synthesize, and a hydroxyl functional group to bind with the probe to the solid support (Maskos: pg. 1683, right col., line 41-44) since both Wagner et al. and Maskos et al. disclose binding the "probe" to the support wherein the functional group of the support comprises a hydroxyl group (Wagner: col. 19, lines 62-67; Maskos: fig. 1, and pg. 1683, right col., line 41-44). Furthermore, one of ordinary skill in the art would have reasonably expectation of success in the combination of Wagner et al. and Maskos et al. because the type of linker use in the design of the array would depend on the type of substrate and probe (Wagner: col. 17, lines 36-43).

Conclusion

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MY-CHAU T TRAN whose telephone number is 571-272-0810. The examiner can normally be reached on Mon.: 8:00-2:30; Tues.-Thurs.: 7:30-5:00; Fri.: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ANDREW WANG can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mct
May 3, 2004

ANDREW WANG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600